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—78. A substantially pure subunit of a human nicotinic acetylcholine receptor encoded by the molecule of claim 75.—

86  
H10  
—79. Isolated nucleic acid of claim 57, comprising the alpha2-encoding nucleic acid that is isolated from a plasmid having all of the identifying characteristics of HnAChR $\alpha$ 2 deposited under ATCC Accession No. 68277.—

—80. Isolated nucleic acid of claim 57, comprising the alpha3-encoding nucleic acid that is isolated from a plasmid having all of the identifying characteristics of HnAChR $\alpha$ 3 deposited under ATCC Accession No. 68278.—

—81. Isolated nucleic acid of claim 57, comprising the beta2-encoding nucleic acid that is isolated from a plasmid having all of the identifying characteristics of HnAChR $\beta$ 2 deposited under ATCC Accession No. 68279.—

—82. A substantially pure subunit of a human nicotinic acetylcholine receptor encoded by the molecule of claim 79.—

—83. A substantially pure subunit of a human nicotinic acetylcholine receptor encoded by the molecule of claim 80.—

2  
cont  
sub  
43  
—84. A substantially pure subunit of a human nicotinic acetylcholine receptor encoded by the molecule of claim 81.—

3  
—85. A plasmid having all of the identifying characteristics of the plasmid deposited under ATCC Accession No. 68277.—

—86. The method of claim 68, wherein:  
the alpha subunit is an alpha2 or alpha3 subunit;  
the alpha2 subunit is encoded by a sequence of nucleotides comprising the DNA in the plasmid HnAChR $\alpha$ 2 deposited under ATCC Accession No. 68277 that encodes alpha2 or is encoded by a sequence of nucleotides that has substantial sequence homology to DNA in the plasmid HnAChR $\alpha$ 2 that comprises alpha2-encoding DNA;

the alpha 3 subunit is encoded by a sequence of nucleotides comprising the DNA in the plasmid HnAChR $\alpha$ 3 deposited under ATCC Accession No. 68278 that encodes alpha3 or is encoded by a sequence of nucleotides that has

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substantial sequence homology to the DNA in the plasmid HnACHr $\alpha$ 3 that comprises alpha3-encoding DNA; and

the beta subunit is a beta2 subunit encoded by a sequence of nucleotides comprising the DNA in the plasmid HnACHr $\beta$ 2 deposited under ATCC Accession No. 68279 that encodes beta2 or is encoded by a sequence of nucleotides that has substantial sequence homology to the DNA in the plasmid HnACHr $\beta$ 2 that comprises beta2-encoding DNA. —

—87. The method of claim 68, wherein:

the alpha subunit is an alpha2 or alpha3 subunit;

the alpha2 subunit is encoded by a sequence of nucleotides comprising the DNA in the plasmid HnACHr $\alpha$ 2 deposited under ATCC Accession No. 68277 that encodes alpha2;

the alpha3 subunit is encoded by a sequence of nucleotides comprising the DNA in the plasmid HnACHr $\alpha$ 3 deposited under ATCC Accession No. 68278 that encodes alpha2; and

the beta subunit is a beta2 subunit encoded by a sequence of nucleotides comprising the DNA in the plasmid HnACHr $\beta$ 2 deposited under ATCC Accession No. 68279 that encodes beta2. —

—88. The nucleic acid of claim 53, wherein the subunit is an alpha2 subunit. —

—89. The nucleic acid of claim 53, wherein the subunit is an alpha3 subunit. —

—90. The nucleic acid of claim 53, wherein the subunit is an beta2 subunit. —

—91. The cells of claim 61, wherein said cells additionally contain a reporter gene expression construct; and

the reporter gene expression construct comprises:

a transcriptional control element, and

a reporter gene encoding a transcriptional and/or translational product;

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the transcriptional control element, in said cell, is responsive to an intracellular condition that occurs when a human neuronal nicotinic acetylcholine receptor interacts with a compound having agonist or antagonist activity with respect to said receptor;

said product can be, directly or indirectly, detected; and

the reporter gene is in operative association with said transcriptional control element. —

—92. A method for screening test compounds for activity as nicotinic acetylcholine receptor agonists or antagonists, comprising:

comparing the difference in the amount of transcription of a reporter gene in the cells of claim 91 in the presence of the compound with the amount of transcription in the absence of the compound or with the amount of transcription in the control cells that do not express nicotinic acetylcholine receptors, but contain the reporter gene expression construct, wherein compounds that exhibit activity as agonists or antagonists are identified. —

—93. The method of claim 92, wherein, prior to comparing the difference in the amount of transcription, the cells of claim 91 are contacted with a nicotinic acetylcholine receptor agonist. —

—94. The method of claim 93, wherein the agonist is nicotine. —

—95. The method of claim 93, wherein, prior to contacting the cells with a test compound, the cells are contacted with a nicotinic acetylcholine receptor agonist. —

—96. An isolated nucleic acid molecule, comprising the sequence of nucleotides set forth in SEQ ID No. 9. —

Please amend claims 53-61, 68 and 73-75 as follows:

53. (Twice amended) A substantially pure nucleic acid, comprising a sequence of nucleotides encoding a subunit of a human neuronal nicotinic acetylcholine receptor, wherein said subunit is selected from the group

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consisting of an [alpha] alpha2 subunit, an alpha3 subunit and a [beta] beta2 subunit.

54. (Amended) The [molecule] nucleic acid of claim 53, wherein the subunit is an alpha2 subunit that comprises a sequence of nucleotides set forth SEQ ID No. 1 and 3, an alpha3 subunit that comprises a sequence of nucleotides set forth in SEQ ID No. 5 and 7 or a beta2 subunit that comprises a sequence of nucleotides set forth in SEQ ID No. 9.

55. (Amended) A substantially pure subunit of the human neuronal nicotinic acetylcholine receptor encoded by the [molecule] nucleic acid of claim 53.

56. (Twice amended) A substantially pure subunit of the human neuronal nicotinic acetylcholine receptor encoded by the [molecule] nucleic acid of claim [54] 53.

57. (Twice amended) An isolated nucleic acid, comprising [that includes] a sequence of nucleotides that encodes a subunit of a human neuronal nicotinic acetylcholine receptor and hybridizes under conditions of high stringency to a sequence of nucleotides encoding a subunit [according to] of claim [54] 53.

58. (Twice amended) The nucleic acid [according to] of claim 54, wherein said nucleic acid comprises a sequence of nucleotides selected from the group consisting of:

a sequence of nucleotides encoding an alpha2 subunit and having the restriction map of the DNA encoding the human alpha2 subunit set forth in Figure 1,

a sequence of nucleotides encoding an alpha3 subunit and having the restriction map of the DNA encoding the human alpha3 subunit set forth in Figure 2, and

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a sequence of nucleotides encoding a beta2 subunit and having the restriction map of the DNA encoding the human beta2 subunit set forth in Figure 3.

59. (Amended) Isolated cells containing any one or more of the [molecules] nucleic acids of claim 53. *E<sup>2</sup> concl.*

60. (Amended) Isolated cells containing one or more of the [molecules] nucleic acids of claim 54.

61. (Amended) The cells of claim 59 that express a nicotinic acetylcholine receptor that contains one or more subunits encoded by [said] the nucleic [acid molecule(s)] acids.

68. (Twice amended) A method for screening compounds for activity as nicotinic acetylcholine receptor agonists or antagonists, said method comprising:

contacting cells [according to] of claim 61 with a test compound, and thereafter

monitoring the nicotinic acetylcholine receptor activity of the cells by [measuring binding of nicotine to the cells,] monitoring the performance of the cells by measuring a performance parameter selected from the group consisting of [measuring] the flux of ions through the membranes of the cells, nicotine binding to the receptors, [or measuring] and the electrophysiological response of the cells or the electrophysiological response of the cells. *E<sup>3</sup> sub 75*

73. (Amended) Isolated nucleic acid, comprising [that includes] a sequence of nucleotides [encoding] that encodes an alpha2 subunit of a human nicotinic acetylcholine receptor and [hybridizes under conditions of high stringency to a sequence of nucleotides in the coding sequence of] has substantial sequence homology to the alpha2-encoding DNA in the plasmid HnACHra2 deposited under ATCC Accession No. 68277. *E<sup>4</sup>*

74. (Amended) Isolated nucleic acid, comprising [that includes] a sequence of nucleotides [encoding] that encodes an alpha3 subunit of a human